11 pts

I am really disappointed in this, Joe. You are a bright person but you didn't show what you have learned. Observation was to be done in classrooms – not helping out in a computer lab.

Real classrooms are very different & you need to know that before you do student teaching. I hope that you did learn more about these topics than you demonstrated here. We went over our expectations many times – I'm sorry you missed the point.

AKM

I enjoyed having you in class. Your sense of humor brightened our nights at times. 11

EDUC 507 TEACHING STRAT: MATH/SCIENCE
OBSERVATION LOG

DATE	HOURS	SCHOOL	SIGNATURE
9/17	3.5	VENADO MIDDLE SCHOOL	

EDUCATION 507 - CHAPTER RESPONSE SHEET

Joe Bustillos **September 8, 1993**
TEAM NAME ?
CHAPTER 1, Kauchak

1. 3 MOST IMPORTANT POINTS:

One of the things that stuck in my mind from the Math Framework was the idea of teaching for understanding and problem solving and not necessarily for memorization. I was very interested in the section about "learning to teach."

2. WHY THIS IS IMPORTANT TO ME:

It's been my experience in the past (especially at the college level) that all of the emphasis has been on content knowledge and covering the material with little thought seemingly given to student understanding.

3. A QUESTION I STILL HAVE:

I think you missed the point of this activity. You need to list 3 imp. pts / tell why they are important to you.

Please redo this for Ch. 1 Kauchak - not the framework.

EDUCATION 507 - CHAPTER RESPONSE SHEET

Joe Bustillos **September 22, 1993**
TEAM NAME Thanks :)
CHAPTER 1, Kauchak --- second attempt

1. 3 MOST IMPORTANT POINTS:

The first important point is teaching methods based on sound research. As the book points out many of the changes in education made in the 60's and 70's were based on the theories of prominent thinkers and not necessarily classroom research.

A second point is that all the classroom research in the world cannot replace teacher knowledge of the subject matter. Actually assessing the importance of teacher knowledge of the subject matter was ascertained through classroom research.

A third important part is the importance of the process of teaching itself. This is the methodologies portion of teaching. This is the part that relates to the large decision making burden placed on teachers (and part of the reason that automated programs cannot in the near future replace good ol' fashion hands-on teaching).

2. WHY THIS IS IMPORTANT TO ME:

After the experimental 60's and 70's and retrenchment and finger-pointing of the 80's it is important that teachers turn to the research to find out what works and what doesn't. I am aware, however, that "research" itself must be carefully assessed. Extensive classroom research on effective and efficient teaching is certainly a step up from ivory tower guesses but the implications and evaluations must be carefully weighed. There are always differing opinions about what the research is trying to say and this should not be forgotten.

The second part, about teacher familiarity with the subject matter, is so fundamental. Realism requires, however, that we do not construe this into saying that good teachers must be "experts" in the subject matter. The information explosion that we are currently living in simply makes this "expert" paradigm unworkable. The world is changing much too quickly. Major technologies are evolving on 18-month cycles. But this does not excuse the multi-subject teacher from having a working knowledge of the given subject and means to build on that knowledge.

And the third meshes somewhat with the second. Being a good teacher is not a matter of merely passing down data from teacher to pupil. For just as the subject matter is no longer understood as being static neither are the students. To stretch this analogy, teaching becomes a matter of bringing two moving objects together.

3. A QUESTION I STILL HAVE:

I like that!

EDUCATION 507 - CHAPTER RESPONSE SHEET

Joe Bustillos **September 22, 1993**
TEAM NAME _____
CHAPTER 2

1. 3 MOST IMPORTANT POINTS:

In dealing with diversity in the classroom the most important point had to do with creating a positive classroom climate. Whether it was different learning abilities, cultural diversity, or exceptional students it always came back to the teacher. Therefore under the rubric of creating a positive classroom climate I feel we have the three most important points of the chapter:

A. Teacher Caring: The Human Dimension of Teacher
B. Orderly Classroom Climate: Classroom Management
C. Positive Expectations

2. WHY THIS IS IMPORTANT TO ME:

This is important to me because in my 533 class we've learned that over 50 percent of the elementary student population in Orange County is Hispanic (Latino/Chicano/Mexican-American...) and Kauchak estimates that in every class of thirty student will be two or more exceptional student. Being successful in this environment is what teaching today is all about. Having a classroom full of kids with relatively the same S.E.S., learning abilities and White Protestant American cultural heritage is a thing of the past (of course if I was in the classroom it wasn't true even then).

Teacher Caring is not just a sentimental ping about students from different ethnicities and outside the "mainstream" learning groups. Caring has to do with being aware of the different ethnicities and creating an environment in which the teaching is accessible to these students. It is about creating a bridge that lessens the cultural/learning dissonance.

Classroom management is the proactive side of caring. It is having strategies in place to deal with the different learning abilities. It's about creating an atmosphere of security (part of Maslow's hierarchy)---a warm and caring environment.

Positive expectation is also about educational accessibility. Knowing about cultural diversity, exceptional students and learning abilities is not enough. Knowing these things can lead to a kind of segregation in which being a part of one of these groups limits the students potential. Positive expectations say, given these realities of cultural diversity, exceptional students and learning abilities the teacher needs to project forward toward the potential of these students like any other students. These diversities should be a stepping stone not a wall

3. A QUESTION I STILL HAVE:

EDUCATION 507 - CHAPTER RESPONSE SHEET

Joe Bustillos **September 29, 1993**
TEAM NAME _____
CHAPTER 3

1. 3 MOST IMPORTANT POINTS:

To paraphrase the Real Estate salesman, the three most important points are: planning, planning, and planning. Actually the chapter breaks down into five sections: 1. A Functional Analysis; 2. Variables in Instructional Planning; 3. Models of Planning; 4. Research on Teacher Planning; and 5. Synthesis of Research and Experience.

But if I were to try to reduce this back down to three points I would have to start with looking at the Function of Planning --- Why do we plan and what do we hope to accomplish. A second point would be to look at the various planning models --- do they accomplish their objectives. And thirdly, How do I take my teaching style and utilize the models and research findings.

2. WHY THIS IS IMPORTANT TO ME:

Every teacher I've had for observation hours has expressed a certain level of dissatisfaction over his/her "lesson plans." And the general feeling that I get is that they become more self-conscious of the way they conduct their class in comparison to the various "lesson plans" standards---especially with a prospective teacher looking over their shoulder. My take on this chapter is that written planning is essential, it lightens the burden of decision making. But it is a tool that we use and craft in our own image. We use it, we don't serve it.

3. A QUESTION I STILL HAVE:

Perhaps the teachers you've visited aren't happy with their plans because they realize they didn't really prepare properly or sufficiently & their conscience is bothering them?

EDUCATION 507 - CHAPTER RESPONSE SHEET

Joe Bustillos **September 29, 1993**
TEAM NAME _____
CHAPTER 4

1. 3 MOST IMPORTANT POINTS:

The 3 most important points would be
1. use of time - time management;
2. personal characteristics of an effective teacher; and
3. general characteristics of an effective lesson (structure)

2. WHY THIS IS IMPORTANT TO ME:

These are more nuts and bolt "how-to" kind of things. Time allocation and management says a lot about overall classroom management. Personal characteristics expresses the level of engagement and structure that the teacher brings to the lesson. And the last part, characteristics of an effective lesson, expresses important means of bringing students into the learning, building on previous knowledge, connecting learning with previous learning and the students' take on the lesson.

3. A QUESTION I STILL HAVE:

EDUCATION 507 - CHAPTER RESPONSE SHEET

Joe Bustillos October 6, 1993
TEAM NAME _____
CHAPTER 5

1. 3 MOST IMPORTANT POINTS:

A. Teacher's questions are well focused on the lesson goal
B. Teacher's questions are sensitive to the students' responses - using prompts, cues and giving the students enough time to think about their responses
C. Teacher uses Group work to help promote active-learning from all students.

2. WHY THIS IS IMPORTANT TO ME:

The first point has to do with Teacher planning, knowledge of subject and connects with the second point in allowing the teacher the freedom to ask opened-questions without diverting from the lesson. Kuachak also mentions how questions are used to diagnose, instruct, and motivate. The second part has to do with teacher's focus on his/her students - adjusting the questions to increase understanding. The third part has to do with breaking the class down into groups that allows all students to participate. The effective teacher would combine all of the above elements: questioning in large groups, and small group discussion, to promote learning. Bloom's Taxonomy is also mentioned in this chapter to emphasize the need to move beyond learning as data acquisition to interacting with the data

This is a little confusing to read. I assume "first part" refers to A, your 1st important point?

3. A QUESTION I STILL HAVE:

EDUCATION 507 - CHAPTER RESPONSE SHEET

Joe Bustillos October 6, 1993
TEAM NAME _____
CHAPTER 8

1. 3 MOST IMPORTANT POINTS:

The three main points are:
- skills in the curriculum,
- Planning for Skills Instruction, and
- Teaching Skills

(skills, skills, skills---imagine that?). A recurring theme in education! :)

2. WHY THIS IS IMPORTANT TO ME:

Skill learning is a foundational part of instruction - beginning from basic rule following to personal hygiene to math or language rules/skills. Skills are taught through a combination of instruction and action. Two of the goals of skills instruction is making the skill automatic (the books automobile driving example) and transferring the skills across subject matter.

Like all the other areas of instruction - the instructor must be aware of the classes skill level and plan accordingly. The last point, teaching skills follows a rather linear path from skill introduction through explanation, teacher-directed practice, independent practice and ending in extended practice.

3. A QUESTION I STILL HAVE:

EDUCATION 507 - CHAPTER RESPONSE SHEET

Joe Bustillos **October 27, 1993**
TEAM NAME _____
CHAPTER 9

1. 3 MOST IMPORTANT POINTS:

1. Models of the Thinking Process

"Models of the Thinking Process" might communicate an action specific behavior that is not part of this Main Theme. It might be better communicated as "aspects of" or "dimensions of" the Thinking Process. The dimensions that the book discusses are Domain-specific knowledge, basic processes, metacognition, and attitudes and dispositions. The main difference between the book's "model" and prior "models" is the inclusion of metacognition, of thinking about thinking.

2. Principles for Teaching Thinking

Like many of the other strategies at skill teaching, teaching thinking requires explanation, modeling, and practice with feedback. The book emphasizes intense concentration on a small number of skills at a time (eg., comparison and contrast) versus attempting to introduce and teach numerous skills in one lesson (eg., comparison and contrast, categorize, analysis, cross-content connections, synthesis, etc.).

3. Teaching Thinking.

Again, like other skills teaching, teaching thinking requires identifying a content topic, content and thinking-skills goals, and preparing examples or data displays. The main difference is whether the content aspect of the lesson plan is merely the backdrop to the thinking skills aspect or whether the two are integrated. The book prefers the later (integration)

2. WHY THIS IS IMPORTANT TO ME:

Teaching "thinking" goes beyond the traditional "information bucket" model of education. In a world where no one person can possibly master all aspects of a single subject, becoming a critical thinker, and being able to make connections across disciplines is fundamental towards making effective use of the flood of information that pours across our horizons. So much of prior math/science education assumed that a rote memorization paradigm would adequately serve the students' needs. Critical thinking asks "why" is such a thing true, and plays a broad role in successfully navigating through the demands of modern society (eg., developing a healthy inquisitiveness about statistics and "polls").

3. A QUESTION I STILL HAVE:

Too bad our present society hasn't had as much opportunity to develop thinking skills!

EDUCATION 507 - CHAPTER RESPONSE SHEET

Joe Bustillos **October 27, 1993**
TEAM NAME _____
CHAPTER 10

1. 3 MOST IMPORTANT POINTS:

1. Students as resources

Students can be used in the classroom to tutor other students of the same age or of lower grades (peer tutoring). The overall teaching paradigm could also be shifted to use Cooperative learning in which students work primarily in small groups to work on both skill and content areas. A third way that students are a resource is to use group investigations, such as the jigsaw technique in which an individual in each small group becomes an "expert" on a specific area with the specific aim of teaching that area to the other students in his/her group.

2. Discussion Strategies

Discussions can be used to promote "high learning" skills or in the *affective domain* to address open-ended moral or value issues. On a small group level discussion helps promote cooperation, communication, inclusion, and exposure to differing opinions.

3. Technology and Teaching

Computer literacy is the chief implementation and concern of education and technology. Computers are beginning to contribute to the classroom through Computer-assisted instruction, tutorials, simulations, and games. Teachers can also use computers to assist in record keeping, grading and general organization (computer-managed instruction, CMI).

2. WHY THIS IS IMPORTANT TO ME:

32=34

In a world in which a single teacher must effectively "teach" a possibility of over thirty students sharing the responsibility with high-achieving students would be logical alternate to "early retirement." Again, getting away from the "Teacher in the pulpit dispensing Truth" paradigm utilizing the strengths of some students and cooperative interaction makes the most sense. But with all tools these require specific careful planning, matching the strategy with the goals.

Computers have also made their presence felt in society and in the classroom. That they are there is not the question but how to effectively use them. Though the book briefly touched on this, using technology in the classroom is like using any other strategy. It is still a matter of careful planning, clear goals, and a good "Plan B" if the technology fails.

well said, Joe!

3. A QUESTION I STILL HAVE:

TOPIC SECTION:

TOPIC: Classroom Climate

SUMMARY OF OBSERVATIONS: In some of the classroom I've observed

RELATIONSHIP TO THEORY & INFORMATION:

PERSONAL REACTION & REFLECTION:

UNANSWERED QUESTIONS:

TOPIC: Planning & Curriculum

SUMMARY OF OBSERVATIONS: The first teacher I interviewed said ...

RELATIONSHIP TO THEORY & INFORMATION:

PERSONAL REACTION & REFLECTION:

UNANSWERED QUESTIONS:

TOPIC: Classroom Questioning

SUMMARY OF OBSERVATIONS: In some of the classroom I've observed

RELATIONSHIP TO THEORY & INFORMATION:

PERSONAL REACTION & REFLECTION:

UNANSWERED QUESTIONS:

TOPIC: Use of Manipulatives in Math

SUMMARY OF OBSERVATIONS: In some of the classroom I've observed

RELATIONSHIP TO THEORY & INFORMATION:

PERSONAL REACTION & REFLECTION:

UNANSWERED QUESTIONS:

TOPIC: Traditional Group Learning & Cooperative Learning

SUMMARY OF OBSERVATIONS: In some of the classroom I've observed

RELATIONSHIP TO THEORY & INFORMATION:

PERSONAL REACTION & REFLECTION:

UNANSWERED QUESTIONS:

TOPIC: Critical Thinking Skills

SUMMARY OF OBSERVATIONS: In some of the classroom I've observed

RELATIONSHIP TO THEORY & INFORMATION:

PERSONAL REACTION & REFLECTION:

UNANSWERED QUESTIONS:

TOPIC: Evaluation of Student Learning

SUMMARY OF OBSERVATIONS: In some of the classroom I've observed

RELATIONSHIP TO THEORY & INFORMATION:

PERSONAL REACTION & REFLECTION:

UNANSWERED QUESTIONS:

TOPIC: Use of Computers in the School

SUMMARY OF OBSERVATIONS: In some of the classroom I've observed

RELATIONSHIP TO THEORY & INFORMATION:

PERSONAL REACTION & REFLECTION:

UNANSWERED QUESTIONS:

TOPIC: Motivation and Discipline

SUMMARY OF OBSERVATIONS: In some of the classroom I've observed

RELATIONSHIP TO THEORY & INFORMATION:

PERSONAL REACTION & REFLECTION:

UNANSWERED QUESTIONS:

TOPIC: Hands-On Science Lessons

SUMMARY OF OBSERVATIONS: In some of the classroom I've observed

RELATIONSHIP TO THEORY & INFORMATION:

PERSONAL REACTION & REFLECTION:

UNANSWERED QUESTIONS:

JOE BUSTILLOS

SIMCITY PRESENTATION:

INTRO:

If I came into class and began lecturing:

[overhead 1 - developing instructional skills jumble] REPEAT

"Today, class, I am going to lecture on the history of redaction criticism and it's effect on Aramaic-speaking Slavic immigrants living in Upper Mesopotamia during the reign of Xerxes in the 3rd Millennium B.C.E. [pause] Please take careful notes. "

What would be the typical response?

[overhead 2 - sleeping student] REPEAT

We learn best by "doing"

But there are some things that are unsafe or just not really doable in the typical classroom

[overhead 3 - Unsafe "Class work"]

So what do we do? Do we go back to . . . :

REPEAT: [overhead 1 - developing instructional skills jumble]

"And then in his fiftieth year as the Crimean Petash over all outer Slob-area . . . " ???

"The Heavens Forbid!" Enter Mr. Computer

[overhead 4 - running computer]

ARTICLE:
"Save the Cities! SimCity in grades 2-5" by Pat Jacobson

[overhead 5 - Jacobson reduced two-page graphic]

In his article, "Save the Cities! SimCity in grades 2-5," Pat Jacobson writes: "From the quiet recesses of my small classroom in a town of 6,000 people on an island 200 miles away from the mainland, we saved Detroit from the ills of the criminal world, we rebuilt San Francisco after we cleared away the rubble from the 1906 earthquake, and we prepared Boston for a nuclear meltdown. But did we learn anything? You bet we did, without even trying?"

"THE GAME"

SimCity is a simulation program that puts the "player" in the position of mayor of any one of several cities and gives the player the control to allow the city to grow or to cause its demise.

[overhead 6 - SimCity Opening Menu]

What separates SimCity from prior generations of simulation programs is that those prior simulations forced the players to concentrate so much on the program that "learning" would be secondary --- some programs seemed downright arbitrary while others were basically elaborate guessing games.

[overhead 7 - Planetfall graphic]

Preparation

"The best demonstration of the spontaneity of educations is usually preceded by hours of planning" JBB [overhead 8]

Jacobson's preparation? Cut the kids loose - actually he just gave them a brief run-down of basic computer skills.

[overhead 9 - Simcity Typical Map]

Acquisition of Subject Matter

Jacobson writes: "After several sessions of building cities, running out of money, or getting wiped out by disaster, students were quite ready to take their roles as mayors seriously and to become informed on how to develop successful cities. They actually wanted to read the manual!"

But rather than dropping the manual on their collective laps Jacobson compiled a 55-question packet which referred back to the manual to answer

[overhead 10 - SimCity Questions]

Mastery of Skills

Next Jacobson let the students return to the program creating their own cities, right down to the physical terrain of the land. The one stipulation he required was turning off the "disaster" mode saying, "Disasters are fun but I found them to be too disruptive to skill learning and proficiency."

Creation of Product

After further experience Jacobson unleashed the student on one of the scenarios supplied with the program, "Dullsville"---a berg on with some potential but on the downhill slide
[overhead 11 & 12 - Scenario Selection and Dullsville]

Development of Attitudes

The net result of this exercise was that students interacted with material and gained a level of understanding that would otherwise be difficult to achieve. Jacobson writes about second-graders pondering over whether or not to raise taxes 9% or 10%. Jacobson writes: "He postulated that he really needed to raise more money; he didn't want to cut the transportation fund because he didn't want his roads to be riddle with potholes like they are in the town he lives in. This seven-year-old was concerned about raising taxes, however, because 'people always get so mad when the taxes get messed with.'"

Jacobson originally thought that the program would help the students gain insights to topics outside the regular classroom learning. Instead they seemed to be learning about their own environment. He concluded by suggesting a classroom visit by a local city council member to fill out the discussion.

REPEAT [overhead 2 - sleeping student]

Only after launching into this project did I realize that the only connection between this article and Sci/Math was its use of technology---SimCity is actually more geared toward teaching Social Science lessons. Oops. Fortunately Maxis Software, the makers of SimCity, also produce simulations programs with more direct science applications. One uses a whole earth simulation to investigate ecology, geology, etc., called SimEarth. Another postulates "What-if" scenarios with genetics called SimLife. And another deals with the micro-world of Ant and survival called SimAnt.

[overhead 13 - SimAnt Screen]

One word of caution which Jacobson doesn't mention specifically. Computers are coming into the school environment in a big way. And just like other technologies that preceded it, such as the VCR, the overhead projector, the xerox machine, and the ditto machine, there will be a temptation to try to use it with everything. But just like any other tool, the key to success is careful, well-planned, specific application.

[overhead 14 - Kay Quote]

Save the Cities! *SimCity* in grades 2-5

by Pat Jacobson

From the quiet recesses of my small classroom in a town of 6,000 people on an island 200 miles away from the mainland, we saved Detroit from the ills of the criminal world, we rebuilt San Francisco after we cleared away the rubble from the 1906 earthquake, and we prepared Boston for a nuclear meltdown. But did we learn anything?

You bet we did, without even trying. We were using *SimCity*™, a powerhouse of a software package that puts you in the position of mayor of any one of a number of city structures and gives you the controls to allow the city to grow or to cause its demise. You can sit back and watch or take a very active role in affecting the developmental process.

If you sit back and watch, the "Simulator" carries on, moving "Simulated Citizens" in and then moving them out as the city progresses through circumstances controlled by the program. You would undoubtedly be driven to intercede, using tools to plan, lay out, and build commerce, waterways, residential and industrial areas, and to manage the issues and situations that occur throughout progress (or regress.)

There are any number of possible strategies, and the user is the strategist. *SimCity* provides a set of rules for working the program that are based on city planning and management practices. The user works through building or rebuilding a city following these guidelines and operating within these limits. Examples are how and when residential growth occurs, the influence of tax rates on the city, the correlations between land value and locations of particular entities, and so forth. Rules are affected by the user's actions and in turn control the development of the simulation.

Is it a "Game" or a "Simulation"?

Well, it's billed as a game. Maxis Software, the developer of *SimCity*, refers to its creation as the "first of a new type of entertainment/education software, called System Simulations." Regardless of the name, association with this type of software opens a window into an aspect of life that a group of students would ordinarily not experience in such a continuous and complete form. There is a freedom to experiment that may never be found in the equivalent real-life situation; that is, if students would even be exposed to a similar real-life situation. Access to information is in response-to-user activity, rather than through sequential presentation. Feedback is immediate, limited only by the speed of the computer. The potential for learning is incredible.

Not a great deal is known about how teachers get easily and efficiently involved with gaming curriculum, especially with packages such as *SimCity* that are so heavy with detail. After having seen a demonstration of *SimCity* in action, I was both excited and compelled to use this package as my first comprehensive use of interactive, subject (rather than task) oriented software to help my students experience thinking and problem solving in a complex, explorative manner.

Preparation

My 24 students come to my classroom for 30 to 45 minutes a day—a pull-out program for gifted students. They come in small groups of two to four students. There are several Apple IIc computers in the room, but only one Macintosh, so students rotate in using the Mac.

The mechanics of *SimCity* include five different windows, three of which provide access to 20 different categories of information needed to make positive decisions during the play of the game. The other two windows are where we can make things happen through the use of 18 different tools. There are at least 15 types of graphics depicting entities within a city and two indicators on the screen that provide a constant indication of zoning needs and the cost of any action we take based on the tool selected. If that's not awesome enough, there are eight different disasters that can occur randomly, unless we turn off that option. By the way, you can pick from eight different scenarios or start your own from scratch.

I was quite intimidated trying to decide how to begin this exercise. There is too much to this program to sit down and explain the details before starting to use it. As with most software, the hands-on approach has far more impact on the learning curve than lectures, so after a general walk-through on my part, I turned each individual or group loose.

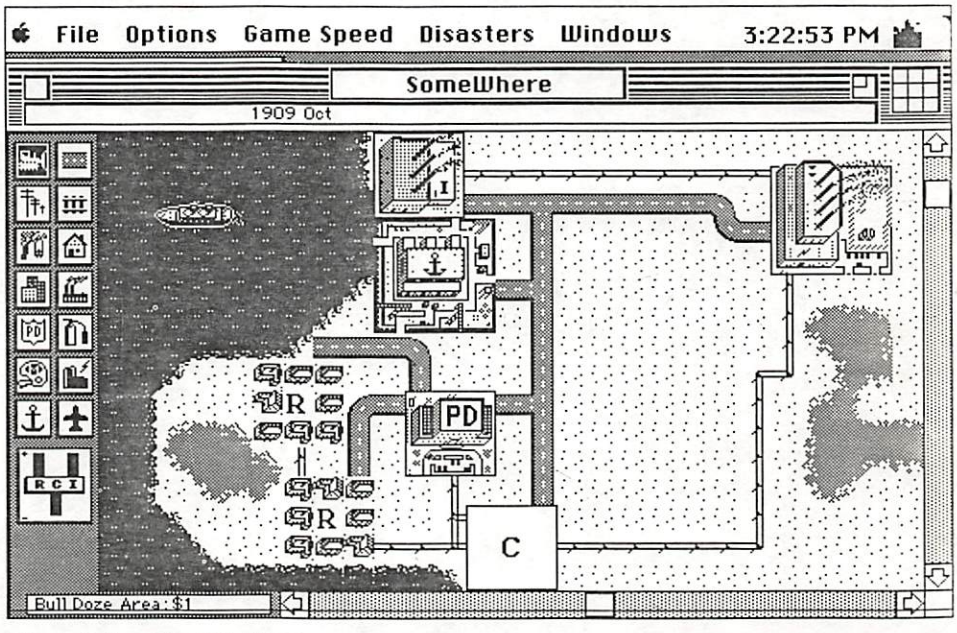


Figure 1. SimCity *Edit Window.*

I told my students how to "Start New City" (menu option). The first option they have is to "Generate a New Terrain" or "Use this Map." We clicked "Use this Map," and the students gave names to their cities. The first window to appear is the Maps Window, which provides demographic information and access to the Edit Window. Everyone had the option to click and drag the flashing box to the part of the map they wished to develop, and then double click to open the Edit Window (Figure 1.)

Then the fun began. I merely had to tell my students to click on the icons on the left of the screen (which represent buildings, zones, utilities, public services, etc.) and click again on the map to put that item in place. The students began to make random placements and in no time discovered that once they placed some houses, they needed a power plant and then power lines and then industrial zones and then roads to get to work....

After several sessions of building cities, running out of money, or getting wiped out by disaster, students were quite ready to take their roles as mayors seriously and to become informed on how to develop successful cities. They actually wanted to read the manual!

Acquisition of Subject Matter

Rather than just turn to page 1 in the manual, I preferred a more structured approach. I used a modified content reading format to compile a 55-question packet for each student. For some questions, I simply presented some information in the packet, referencing the appropriate page in the *SimCity* manual, in order that they would not overlook that particular key piece of information. For other questions, I referred them to a particular section and asked them to retrieve the relevant answer (Figure 2). Each student worked at his or her own rate. Some students were able to answer questions without referencing the manual based on what they already experienced operating the program.

Naturally, the students became more and more anxious as they worked through this fact-finding mission to return to the computers. However, I wanted to be certain that everybody had a comprehensive trip through the instructions before returning and that everyone was returning with the same knowledge base. The information they were getting actually helped them develop the skills they needed to make decisions in the program. If I had asked them to merely read the manual from cover to cover, I would have faced a lynch mob. This approach made the learning a little more palatable.

What is an advantage and a disadvantage of placing a power plant next to residential zones?
How does the computer tell you that you don't have sufficient funds for the icon you've selected?
Where would you go to find a record of past trends and cycles of your city?
Why is the *Demand Indicator* important?
What happens to roads if you do not maintain them in your transit budget?

Figure 2. Sample questions for SimCity.

Mastery of Skills

Back to *SimCity* to try out their discoveries on program details—I again allowed the students to create their own cities, choosing their own terrain. If students did not like the layout of the terrain presented (perhaps not enough water to try building harbors or not enough space for an airport), they just asked for a new terrain. They were able to continue working on the same cities for a few days, taking advantage of the save option. One restriction I did place was to turn off the "Disaster" mode; disasters are fun but I found them to be too disruptive to skill learning and proficiency.

Creation of Product

With quite a bit of experience at hand, I then had the students each begin working on one of the existing scenarios that come with the package—"Dullsville." My intent was to have them apply their skills to the same baseline city. After reading the background information, they knew that Dullsville was a "berg" with lots of potential, given the right leader, but that it was currently on the downhill slide, as people were simply bored and were starting to move away. Each student had to examine the financial situation, decide if the tax rate should be raised or lowered, and if the public services should be fully funded. They had a good number of decisions to make beyond finances: What was public opinion? Were there traffic problems? How should the crime problem be dealt with? After addressing the most pressing problems, they began to direct their attentions toward adding more residential, commercial and industrial zones, and opening new parks, stadiums, and so forth—that is, if they still had money left.

Development of Attitudes

I held back the questions in the packet that had students researching the history of cities and city planning (this type of information is also provided in the manual.) I had constructed some questions that were perfect for group discussion; most of this type had more than one appropriate answer. I found my students in spontaneous, healthy, and animated discussions not only on the research questions, but also on how their individual versionsof "Dullsville" turned out. They were eager to share as well as criticize. They were and are still infatuated with *SimCity*, but they were also crazy about this whole unit. Surprisingly, both the primary and intermediate students were eager to explore city government.

Hearing my small second-grader pondering over whether or not to raise taxes for his "SimCitizens" to 9% or 10% was intriguing. He postulated that he really needed to raise more money; he didn't want to cut the transportation fund because he didn't want his roads to be riddled with potholes like they are in the town he lives in. This seven-year-old was concerend about raising taxes, however, because "people always get so mad when the taxes get messed with."

This package provides an environment for optimum learning. It allows students to assume some responsibility for their own learning, learn at their own pace, learn on a level appropriate to their abilities, and to experience a sense of perceived control, achievement, and self-esteem (Clark, 1988).

I had originally thought of *SimCity* as a way to provide insight to topics that would be beyond the learning in their regular classrooms. Instead, in response to my students' excitement, it served as an impetus to learning about their own environment. The next step, then, was to have a local city council member come to discuss our own city scenario, relative to *SimCity* concepts.

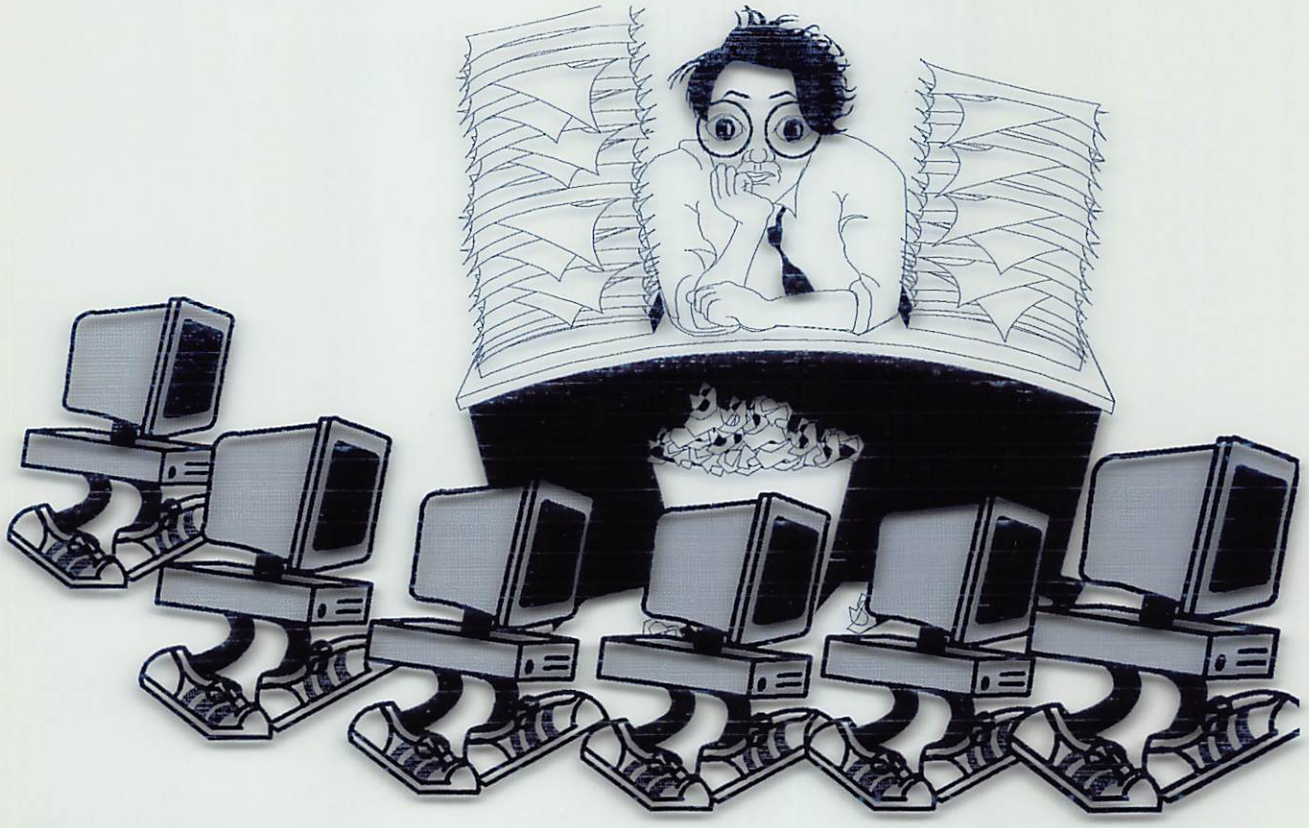
What's next? Disasters, of course. Then on to reconstruct our own city of Kodiak, Alaska in *SimCity*. Hats off to Maxis Software!

[Pat Jacobson, Kodiak Island Borough School District, 722 Mill Bay Rd., Kodiak, AK 99615.]

Software

SimCity, Maxis Software, distributed by Brøderbund, 17 Paul Drive, San Rafael, CA 94903-2101; 800/521-6263.


zzzzzzzzz



Putting computers into schools is like for some reason we thought our kids wouldn't succeed if they didn't become musicians [so] the state legislature decided to put pianos in every classroom. It's not going to help. Any musician will tell you that music is not in a piano.

- Alan Kay, Futurist

EDUCATION 507 - VIDEO CRITIQUE TWO

Joe Bustillos **November 17 1993**

I seemed more relaxed and at home with the "students" than I had been in the last lesson. I was able to build the lesson using questions and providing adequate pauses between each question. There was a lot of data but I used "natural" illustrations and explanations to get the point across. There seemed to be several "ah-ha" moments with the "students."

always a good sign!

During the other lessons I think I did a damn good job working the video camera (capturing the action)!

I do, too! :)

EDUCATION 507 - CHAPTER RESPONSE SHEET

Joe Bustillos **November 10, 1993**
TEAM NAME _____
CHAPTER 11

1. 3 MOST IMPORTANT POINTS:

1. Effective Classroom Management

Establishing what an effective classroom manager does ("to establish a positive learning climate with high expectations") and how instructional skills are brought together with the organization of the specific classroom. Past paradigms in effective classroom management also help guide the new teacher in what works and what doesn't

2. Proactive Classroom Management (Planning)

Like so much of the educational enterprise the gist of this principle can be summed up as: Planning, Planning, and Planning. Only in this case I'm talking about the actual physical environment of the classroom as well as establishing classroom rules and procedures. But effectiveness in planning is also dependent on having a good grasp of the students' developmental level and other characteristics.

3. Plan of Attack in Classroom Management (Implementing)

The book talks about establishing classroom routines within the first 10-days of school's beginning----to the point of focusing on the logistics of ones typical instructional activities, not "sweating" the content areas. The effective manager has to be able to juggle several activities at once maintaining a predictable level of regularity, momentum and smoothness. Part of being effective in the classroom is establishing ones control by demonstrating ones level of awareness and appropriate actions/reactions to this awareness.

2. WHY THIS IS IMPORTANT TO ME:

1. One can be conversant in all the latest educational "techniques" and theories (addressing their students' multiple intelligences, etc.) and miss the mark because ones classroom environment is chaotic and disruptive. Establishing a sense community, that the classroom is a place of trust is an important first step in becoming an effective teacher. This whole chapter reminds me of the problems certain individuals might face, coming from industry having all of the knowledge in the world on their given subject, but, if the governor gets his way, no training on communicating that knowledge to the roomful of students staring back at them (not even thinking about when things become disruptive---as they as so apt to do).

2. The book makes a good point about properly planning the classroom environment to prevent or avoid possible problems as well as having a plan of action when things do go "awry."

3. In my 508 class one of our chapters (from Teaching Children to Care) dealt with the whole practice of establishing classroom routines and practicing basic classroom activities (eg., how to line up for lunch, how to get spelling help, how to put your journals away, how to pass material out, etc). This seems to be such an important part to creating that "positive learning climate" that seems so forgotten when the doors first fly open. Whereas "practicing" might be less important for the upper grades the point is still the same. That is, the classroom needs to have clearly defined Rules, consistently implemented Procedures, and a well-thought out process of managing the little bodies flowing in and out of the doors.

3. A QUESTION I STILL HAVE:

Good response summary.

EDUCATION 507 - VIDEO CRITIQUE

Joe Bustillos **October 27, 1993**

I seemed to make pretty good use of Praise. I consistently used the students' names. I also used a "complete the sentence" technique pretty efficiently. I was also very responsive that the students understood where we were at in the instruction and understood the process. The instruction itself was sequentially given with plenty of feedback from the students.

There were pretty good sounds of activity from the students at which time I remained attentive to any problems the students might have encountered. There was plenty of time given for the activity. I also worked through a difficult problem in the end.

See! It was fun!

EDUCATION 507 - TAKE-HOME MIDTERM

Joe Bustillos **October 20, 1993**

1. Chapter 1, Question 4 - Three Scenarios:

Kindergarten: The teacher might wait a moment and then draw Jimmy into the art activity by asking Jimmy to express his feelings with the art activity. She might also follow up the art activity with a "group meeting" having other students share their "concerns" about being away from home and how they felt and what made them feel better. She might encourage Jimmy to share his concerns, what he misses, and encourage other students to be a "good friend" to Jimmy then while he adjusts to the new environment. If the behavior persists she might spend more time finding out Jimmy's home-life by talking with him privately and/or establishing contact with the parents.

Giving Jimmy a little space to be "sad" about being away from home isn't bad, but hoping that the art assignment will distract him enough to break his funk ignores the opportunity to help Jimmy "work through" his feelings using this new activity. There is also an opportunity to bring other similar-feeling students together to help each other and to create a greater sense of belonging. So much of our school work is detached from our "life experiences" (eg., "I would like you to write a paragraph from our lesson on "Life in the Trees" from the point of view of one of the birds we've studied"---but we've never encouraged them to write from the perspective of a shy third-grader in a room full of people who don't speak the same language). Here's a perfect opportunity to help the student see that the art assignment is about more than just gaining or practicing a skill but also another way to express himself. Well written response

Junior High: Given how far along the problem seems to be: A. The teacher needs to get as much control over his emotions as possible before he act in order to make sure that he isn't projecting his feelings from the "day's accumulation" of frustrations; B. But he also should not hesitate, with as little distraction to the class as possible, to find Mary another seat in the class where she might be less tempted to converse with her neighbor. After his lecture/discussion he should explain to her his action and expectations and possible requirement for her to return to her former seat.

Yes Don't let anger make your decisions

He might also consider whether he's spending too much time in lecture and not enough in class interaction. He might consider using Mary's skills in social interaction by giving her a greater responsibility in the class discussion. Re-evaluating his teaching strategy and reminding her privately of his class behavior expectations earlier in the scenario would have been preferable to reassigning her to a new seat. But he should not allow her to become a

distraction by ignoring her behavior or by having a public confrontation with her (he should quietly reassign the seating with a follow-up discussion/explanation promised).

High School: Of the three scenarios this one seems the most dependent on knowing more about the situation. We need to know whether this whispered sentiment expresses the feelings of the class on a larger scale or a single "trouble maker" looking for a confrontation (to choose two extremes). If it is the sentiment of the class than she might consider how well her teaching strategy works with the material and whether she's making any connections between the material and the students' own lived-experiences. Rather than telling the students how important the material is, perhaps she could consider demonstrating it's importance. As we say in the writing disciplines: it's always more effective to communicate something by showing rather than telling. If she can't demonstrate it's importance other than by the arbitrary distribution of points then how do we know that the importance only exists in her head? If it appears to be a class sentiment, than she should try to make those connections at that point. Something that's worth 25 percent of the class grade is certainly worth the time refocusing it rather than depending on the "bell-curve" to make the "course-correction."

If the original comment is a "lone-gunman" attempt and she can identify the person than she needs make some connections with this person at the first opportunity without creating a public scene or disturbing the class activity. Hearing the student's complaint more fully might help her connect with the few other students that aren't "getting it" and also help communicate to the student that his insights are valued (hopefully bringing him into the class discussion and letting him know that half-muttered quips from the periphery are unnecessary because full-discussion is available). Good thoughtful answers to maintain good classroom control. 5/5

2. **Chapter 2, Question 3 - Film Strip Scenario:**

To borrow from the Real Estate salesman's motto: preparation, preparation, preparation. Before she begins her activity she needs to have her materials prepared and her students prepared. Even if this is a junior high with an hourly rotation of classes, she needs to have the filmstrip ready to go before she begins her instruction. Evidently she also needs to remind the class on what behavior is acceptable and what is not during the showing of the filmstrip. Included with the reminder might be another reminder of the consequences of "acting out." She never establishes control and lets the collection of small distractions become an unproductive environment. She does prepare them for the curriculum subject but not for the activity or for her expectation during or after the activity.

3/5

If it is necessary for some of her students to continue working on assignments during the showing of the filmstrip than perhaps those students should be moved to another room or another distant area in the room so that those watching the film can concentrate and those working on their assignments might have proper lighting.

You need to develop these thoughts into a more orderly response to the essay question.

3. Chapter 3, Question 5: Centralized Planning

> "Earlier this decade [1980s], a Presidential Commission on Education reported that 'if a foreign government had imposed this system of education on the U.S., we would rightly consider it an act of war,'"
>
> Byte columnist Jerry Pournelle

Computer guru Pournelle also cited in the same article a government report that drew a similarity between our system of educational and the Soviet system of collectivized agriculture.[1] When someone suggests that centralized planning on the district or, God forbid, the state level might be the way to go all I have to do is think about how successful the Soviets were with their collectivized farming. Fortunately or unfortunately education and children are not like raising potatoes (children tend to require more than adequate sunlight and proper watering and a failed crop of children is likely to cost the society more than a season of potatoes). People in favor of having a centralized system of curriculum planning may be revealing their own paradigm about education that follows an agriculture or factory mentality. Proper, orderly watering, in one door, out the other, and the children are educated. Again, educating children is not at all like raising potatoes.

Very funny!

To briefly entertain the notion of centralized planning, there is one aspect in it's favor. Centralized planning promises to create a single standard across the whole district, or state (or nation) for all students and classrooms and schools in each grade level. The standard would also include a measured level of achievement between the grades that would apply to all students, classrooms, and schools. Whether you were in a 5th grade classroom in Centralia or Woodland Hills, the students would be working from the same text, answering the same quiz questions, learning the same lesson, and taking home the same homework. Not a bad idea, provided that each student came into the school system with the same life-experiences, the same expectations, the same dispositions, the same abilities, and the same needs. Hell,

---

[1]Pournelle's point was that just as the micro-computer contributed to the de-centralizing of the Soviet system and emergence of "Democracy" so such technology can contribute to a modern renaissance in American education. Pournelle, Jerry. "The Next Revolution." BYTE, vol. 15, no. 9, Sept 1990, p.70.

Interesting quote. Thanks for the clarification.

even potatoes don't do that. That was the one benefit (a uniform curriculum standard across all grades and all classrooms). But humans learn along altogether different lines.

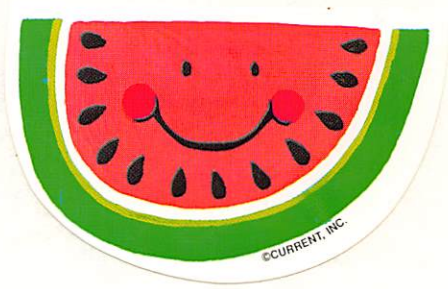
It was noted in our first chapter the number of decisions a teacher must make in a given day. Centralized planning would lessen the strength or options available to a teacher (although the good ones would still work around the curriculum monolith to see to it that his/her students received effective instruction). The system as it seems to be running is standardized by the curriculum framework designed by the State which defines objectives and broad expectations. It is left to the teacher to find a way to make those objectives and expectations possible given the student population he/she faces. The wise teacher will work with and harvest useful curriculum ideas from other teachers. And the wise school and schools districts can encourage teachers to move in specific curriculum directions by offering assistance and resources to achieved the State's framework objectives (make it a benefit package, teachers will be interested in seeing what's available---if that fails, just offer free food).

Good answer to centralized planning. At best, it helps weak, new teachers. At its worst, it is stifling to creativity + individual class/school needs.

5/5

13/15

Joe Bustillos
November 3, 1993
Grade 5
Education 507 - Lesson plan two



Energy: Sound Waves

PRIMARY OBJECTIVE:

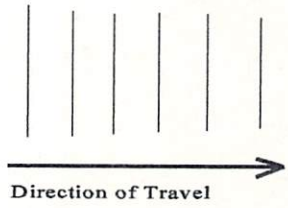
Students will be able to demonstrate two types of energy waves (transverse and longitudinal) and explain two basic difference between them (oscillation orientation and medium).

CONCEPTS:

- ☐ Some forms of energy travel in waves (light, electricity, sound)
- ☐ Some waves are **Transverse Waves** (In transverse waves oscillations occur perpendicular to the direction of the wave, eg., light). No medium required.

Transverse Wave

- ☐ Some wave are **Longitudinal Waves** (In longitudinal waves vibrations occur in the direction of wave motion. Acoustic (sound) waves are longitudinal waves). Medium required (sound = inertia and elasticity); earthquake is a form of a sound wave.



Longitudinal Wave

MATERIALS:

- ☐ 1 2" piece of string for each two students (5 pieces)
- ☐ computer equipped with sound capabilities and suitable monitor (eg., IBM compatible, MS Windows 3.1, soundcard, speakers, microphone, powerbar)

PROCEDURE:

- ☐ **Introduction:** "Crack the Whip" analogy - transfer/transport of energy along a "line" (Transverse wave)
- ☐ **Review:** a property of some forms of energy to travel in waves **(transverse wave diagram).**

- ☐ **Student Activities T-wave:**
  1. students will pair up and each pair will be given a 2" length of string.
  2. one student will be the "sender" and the other the "receiver"; the "sender" give the robe and up and down "flip" motion and the "receiver" will keep his end stationary; note the "energy" moving from one end of the string to the other. Switch roles.
- ☐ **Mini-Lesson - Transverse wave:** above activity = T-wave; "waves' oscillation up and down along the direction of travel" **(transverse wave diagram)**; we used a rope to send "physical energy" but all electromagnetic forms of energy use T-waves and need no medium - can operate in a vacuum (eg., magnetism).
- ☐ **Student Activities L-wave:**
  1. select one student to speak into computer/mic to record "sounds" (have written phrase available).
  2. play back recorded message noting "wave" display. Repeat with a second volunteer.
- ☐ **Mini-Lesson - Longitudinal Wave:** above (2nd) activity = L-wave; waves' vibrations occur in the direction of wave motion - sound waves are L-waves - think: the push the air in front of them (a bunch of people in a slow moving line) **(Longitudinal wave diagram)**; it needs a medium (like air) to operate
- ☐ Small groups: discuss possible other types of energy that use L-waves and T-waves, feel free to come up and get a better look at the computer display of the acoustic (sound wave)

This was an interesting lesson, Joe. Students would enjoy using the computer (keep it for small group). You were well prepared & delivered your information smoothly but in real life, you would really need to monitor your class participation. Remember that "hands-on" should be more than "strings + waves" + computer watching.

Energy: Sound Waves - Info Sources

Grolier's Multimedia Encyclopedia: Energy

Energy, from the Greek energia, meaning "in-work," is the capacity for doing work. Energy can be measured in terms of mechanical work, but because not all forms of energy can be converted into useful work, it is more precise to say that the energy of a system changes by an amount equal to the net work done on the system.

In classical physics, energy, like work, is considered a scalar quantity; the units of energy are the same as those of work. These units may be ergs, joules, watt-hours, foot-pounds, or foot-poundals, depending on the system of units being used. In modern science, energy and the three components of linear momentum are thought of as different aspects of a single four-dimensional vector quantity, much as time is considered to be one aspect of the four-dimensional space-time continuum.

FORMS OF ENERGY

Energy exists in many different forms. The form that bodies in motion possess is called kinetic energy. Energy may be stored in the form of potential energy, as it is in a compressed spring. Chemical systems possess internal energy, which can be converted by various devices into useful work; for example, a fuel such as gasoline can be burned in an engine to propel a vehicle. Heat energy may be absorbed or released when the internal energy of a system changes while work is done on or by the system.

Mass and Energy

Einstein first established that mass itself is one form of energy; this is indicated by the well-known relation E = mc squared, which may be interpreted to mean that if a mass m can be converted into energy, the amount of energy produced is given by the product of the mass and the square of the speed of light, c. Because the speed of light is a large number (c =3 X 10 billion cm/sec), an enormous amount of energy is contained in ordinary matter; but it is generally impractical to convert this mass into useful energy.

Kinetic Energy

Masses in motion possess kinetic energy. For example, an object of mass m moving with speed v possesses kinetic energy one-half mv squared . A wheel with a MOMENT OF INERTIA I, spinning about its center of mass with a variable angular speed represented by the Greek letter omega, has a kinetic energy equal to one-half the moment of inertia times the square of the angular speed. If either of these objects could be brought to rest by appropriate means, useful work could be done; for example, a pulley and rope attached to the wheel could be made to lift a

weight. When the speed of an object becomes comparable to the speed of light, such expressions for kinetic energy are no longer valid and must be modified according to the theory of RELATIVITY.

Potential Energy

A compressed spring possesses energy that can be converted to work by allowing the spring to exert a force against an external device and to move until the spring assumes its original length. When a mass of weight W is lifted to a height h, the mass possesses gravitational potential energy Wh, which can be regained by lowering the mass. Electrical charges possess electrostatic potential energy, which can be converted to work by allowing the charges to move toward or away from each other.

Internal Energy

Energy contained in a system by virtue of the motions of, and forces between, the individual atoms and molecules of the system is called internal energy. When the internal energy of a body changes, heat energy is sometimes generated or absorbed. For example, if a piece of metal is placed in a flame, the temperature of the metal will rise: heat has been absorbed by the metal and its internal energy has been increased; the atoms of the metal are vibrating more rapidly and may be at different distances from one another.

Mechanical Equivalent of Heat

The relationship between heat and work was established when it was noticed that when a fixed amount of work is done on a fluid--stirring it, for example--a fixed amount of heat is always generated (see THERMODYNAMICS). The relationship between heat energy, which is usually measured by observing temperature changes in an object, and mechanical work is called the mechanical equivalent of heat. The relationship is expressed as follows: 1 calorie = 4.186 joules, where 1 calorie is the heat required to raise the temperature of 1 deg gm of water 1 deg C.

Energy in Other Forms

Numerous other forms of energy exist. Radiant energy is energy contained in the form of electromagnetic oscillations, such as light and radio waves. Currents in the coils of an electromagnet generate magnetic fields, which can be thought of as storing energy in the form of magnetic field energy. Processes of BETA DECAY, such as the radioactive decay of the neutron into a proton, electron, and antineutrino, result in the transport of energy by the antineutrino away from the location of the decay with the speed of light; this energy is the result of weak forces of interaction (see FUNDAMENTAL INTERACTIONS).

ENERGY CONVERSION

Certain fundamental laws limit in various ways the conversion of energy from one form to another. Foremost is the law of conservation of energy (see CONSERVATION, LAWS OF),

according to which the sum total of all forms of energy of an isolated system remains constant; that is, energy can neither be created nor destroyed, although it can be converted from one form to another.

An example of the conversion and conservation of energy is the multistage conversion of rest-mass into electrical energy that occurs in a nuclear power plant. First, uranium nuclei absorb neutrons and split into lighter nuclei, with a net decrease in the rest-mass energy of all the particles involved. This may be considered a decrease in the internal energy of the nuclei. This energy is converted to thermal energy that causes an increase in the temperature of the fluids used to cool the reactor. These fluids are passed through heat exchangers that produce steam which, in turn, is used to drive turbines, that is, produce rotational kinetic energy. These turbines can then turn electric generators, which produce electrical energy. The electrical energy may be used in a variety of ways, such as in home heating.

Efficiency of Conversion

In the above example, the ultimate result of the energy conversion process is the production of heat, which is inevitably released into the environment. In all conversion processes there is always some waste heat that prevents complete conversion to useful work.
A precise expression of the limiting conversion efficiency in cyclic processes such as occur in many engines is given by the second law of thermodynamics. This law expresses efficiency in terms of the maximum and minimum temperatures attained. In a conventional power plant, high temperatures make possible an efficiency of conversion of heat into electrical energy of approximately 50 to 60 percent. In nuclear power plants, comparable high temperatures cannot be achieved without damaging the radioactive fuel elements. Consequently, the efficiency is lower and a correspondingly greater amount of waste heat must be exhausted into the environment.

Notable Conversion Processes

Radiant energy from the Sun is converted into heat when absorbed, or it can be converted directly into electrical energy to solar cells. PHOTOSYNTHESIS converts radiation into chemical energy; the energy contained in fossil fuels can ultimately be traced to this process, since such fuels were once photosynthesizing plants.

The most spectacular energy conversion processes are to be found in stars. An ordinary star such as the Sun obtains its energy by converting hydrogen to helium and other heavier elements. A small fraction of the rest-mass energy of the hydrogen disappears and a corresponding amount of energy of other forms, mainly heat and light, is created. When supernovae explosions occur, gravitational potential energy is converted into heat and radiation. Other astrophysical objects such as quasars, whose internal energy mechanisms are not yet understood, appear to give off incredibly large amounts of energy--of the order of 10 to the power of 56 ergs per second--the equivalent of the conversion of about 150 solar masses per second entirely into energy. The mechanisms that produce the highly energetic cosmic rays are also not yet fully understood.

ENERGY TRANSPORT

Energy can be transported from one place to another by several different processes. Electromagnetic energy in the form of radiation propagates with speed c. This is the principal manner in which energy from the Sun is transported to Earth. Mechanical transport of heated fluids, such as air or water, provide the principal transport mechanism of most central heating systems. Heat energy may be conducted through solid objects if there is a temperature difference between opposite sides of the object. Electrical energy is transported along metallic cables from generating plants to homes and industrial sites.

ENERGY AND ENTROPY

Thermodynamic systems, or those which are defined by definite temperature, pressure, and volume, have another property, distinct from energy, and related to the amount of useful work that can be obtained from the system. This property is called ENTROPY, from the Greek word meaning "evolution." When energy is used with the necessary generation of waste heat, the system becomes more disordered--it approaches a more probable state--and the entropy of the system increases. Systems having low entropy possess relatively more energy capable of being converted to useful work. In most natural processes the net entropy change is positive, meaning that less energy is available for conversion to useful work; thus, the net entropy of the universe is always increasing. This means that at least one aspect of the ultimate development of the universe will be to reduce temperature differences to zero. When this occurs, there will be no available energy convertible to useful work. The result will be the so-called heat death of the universe.
W. Brittin And N. Ashby

Bibliography: Alekseev, G.N., Energy and Entropy (1986); Fenn, John B., Engines, Energy, and Entropy (1982); Harrison, G. R., The Conquest of Energy (1968); Hoffman, E. J., The Concept of Energy: An Inquiry into Origins and Applications (1977); Lapedes, Daniel L., ed., McGraw-Hill Encyclopedia of Energy (1976); Romer, Robert H., Energy: An Introduction to Physics (1976); Scientific American Editors, Energy and Power (1971); Stoker, H. Stephen, et al., Energy: From Source to Use (1975); White, Harvey E., Modern College Physics, 6th ed. (1972); Youmans, Ed.ward L., The Correlation and Conservation of Forces (1981); Zichichi, Antonio, ed., Old and New Forces of Nature (1989)

Waves and Wave Motion

Waves are the result of a disturbance of some sort--the motion of an object, a change in an electrical current, or an alteration of an electromagnetic field. The disturbance is transported from one point to another by a wave, but the medium through which it travels does not undergo a net displacement.

Types of Waves

Most waves may be classified as either longitudinal or transverse, according to the motion of the particles of the medium that transports the wave. There are other types of waves, such as

rotational waves and Alfven waves (see MAGNETOHYDRODYNAMICS), but these are difficult to describe and are of less general importance.

Longitudinal Waves.

In longitudinal waves vibrations occur in the direction of wave motion. Acoustic (sound) waves are longitudinal waves. When air is the medium, the air molecules oscillate back and forth in a direction parallel to the direction the waves travel. (Actually, the vibrating "particles" are not individual air molecules, but aggregates of molecules that oscillate about some equilibrium position.) Acoustic waves are a particular member of the general class of elastic waves and require a medium having both inertia and elasticity. The effect on the medium is a series of compressions and rarefactions, regions where the particles are alternately more crowded and then more spread out than they would be in the absence of the wave. After the passage of the wave the particles resume their equilibrium positions and motion; the wave has caused no net displacement.

Transverse Waves.

In transverse waves oscillations occur perpendicular to the direction of the wave. The effect is easily demonstrated by tying one end of a rope to a post and giving the other end a sharp flip up and down. A section of the rope appears to travel toward the post; this is a single wave pulse. A quick series of flips sends a succession of pulses toward the post. Obviously, the rope itself does not move forward and any particle in it undergoes only up-and-down motion; thus the disturbance caused at one end is conveyed to the other by a transverse wave. All electromagnetic waves are transverse waves; they do not require a medium and can travel in a vacuum.

Wave Characteristics

Waves are typically described in terms of their frequency (designated by the Greek letter mu) wavelength (designated by the Greek letter lambda). These are not independent but are related to a third quantity, the velocity, v, by lambda times mu = v. The frequency is measured in cycles per second (cps), or hertz (Hz). Frequency is usually used to specify a given wave because it remains constant under all conditions except when there is relative motion between the observer and the source (see DOPPLER EFFECT). On the other hand the velocity, and therefore the wavelength, depends on the medium. Whenever a wave is specified by its wavelength, as is done with light, the wavelength given is the length that the wave has in a vacuum when it travels at the fixed value c, the speed of light.

The amplitude of a wave is its maximum displacement from equilibrium and is proportional to the amplitude of its source. The intensity of the wave, and therefore the energy it contains, is proportional to the square of the amplitude.

Under suitable conditions, all waves are subject to the phenomena of REFLECTION, REFRACTION, DIFFRACTION, and INTERFERENCE. The successful interpretation of light diffraction in terms of wave theory by Augustin FRESNEL was sufficient to end (temporarily, at least) the question of whether light is a wave or a stream of particles. Although modern quantum mechanics stipulates wavelike properties to objects, and vice versa, it is still considered that diffraction, interference, and so forth are evidence of the wave nature of a beam.

Wave Motion

The simplest form of a wave is one represented by a sine or cosine function, indicating that the particles move with simple harmonic motion (see MOTION, HARMONIC).

Superposition of Waves.

Not all motions are simple harmonic motion, and a wave may be the result of several superimposed vibrations. When these are of the same frequency, the phenomenon of interference occurs. The waveform is still sinusoidal and has the same frequency, but the resultant intensity may be either greater than or less than either of the contributing waves, according to the phase difference. Waves that are "in phase" peak at about the same time and add to each other; waves that are "out of phase" subtract and can cancel each other out entirely.

Two sound waves that differ slightly in frequency can combine to produce beats. The separate waves are alternately in phase and out of phase, causing the loudness of the tone to wax and wane. Waves of the same type (say, a group of electrical waves) but having different frequencies can be superimposed to produce a new waveform. This, in fact, is the principle of AM (amplitude modulation) radio, in which an electrical wave containing the acoustic information (20-20,000 Hz) is mixed with an electrical wave with suitable transmission properties (about 1 MHz) for broadcasting. The radio receiver then separates the audio-frequency signal from the radio-frequency carrier wave.

Although the sound wave produced by a tuning fork has a pure frequency, a note from most instruments, as well as one produced by the human voice, is complex, a mixture of frequencies consisting of the fundamental (the lowest frequency of the mixture) and overtones, or HARMONICS, which have frequencies that are simple multiples of the fundamental. Any complex waveform, even the sawtooth and pulsed waves common in electronics, can be produced or represented by the addition of simple harmonic waves. The branch of mathematics that treats this resolution of periodic functions is called FOURIER ANALYSIS.

Standing Waves.

When two waves having the same wavelength and amplitude travel in opposite directions, the result is a standing wave. There is a waveform, but it does not advance. At regular intervals along the waveform there are points called nodes where no oscillations take place. Standing waves are generally produced by reflection--the meeting of the returning wave and the incoming wave generates the effect. Standing waves may be produced in any substance--liquid, solid, or gas--or in a vacuum. Nearly all sounds created by musical instruments are the result of the formation of standing waves. Mark S. Vogel

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Joe Bustillos
November 3, 1993
Grade 5
Education 507 - Lesson plan two

Energy: Sound Waves

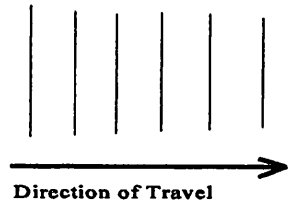
PRIMARY OBJECTIVE:

Students will be able to demonstrate two types of energy waves (transverse and longitudinal) and explain two basic difference between them (oscillation orientation and medium).

CONCEPTS:

- ☐ Some forms of energy travel in waves (light, electricity, sound)
- ☐ Some waves are **Transverse Waves** (In transverse waves oscillations occur perpendicular to the direction of the wave, eg., light). No medium required.
- ☐ Some wave are **Longitudinal Waves** (In longitudinal waves vibrations occur in the direction of wave motion. Acoustic (sound) waves are longitudinal waves). Medium required (sound = inertia and elasticity); earthquake is a form of a sound wave.

Transverse Wave



Longitudinal Wave

MATERIALS:

- ☐ 1 2" piece of string for each two students (5 pieces)
- ☐ computer equipped with sound capabilities and suitable monitor (eg., IBM compatible, MS Windows 3.1, soundcard, speakers, microphone, powerbar)

PROCEDURE:

- ☐ **Introduction:** "Crack the Whip" analogy - transfer/transport of energy along a "line" (Transverse wave)
- ☐ **Review:** a property of some forms of energy to travel in waves **(transverse wave diagram).**

- ☐ **Student Activities T-wave:**
  1. students will pair up and each pair will be given a 2" length of string.
  2. one student will be the "sender" and the other the "receiver"; the "sender" give the robe and up and down "flip" motion and the "receiver" will keep his end stationary; note the "energy" moving from one end of the string to the other. Switch roles.
- ☐ **Mini-Lesson - Transverse wave:** above activity = T-wave; "waves' oscillation up and down along the direction of travel" **(transverse wave diagram);** we used a rope to send "physical energy" but all electromagnetic forms of energy use T-waves and need no medium - can operate in a vacuum (eg., magnetism).
- ☐ **Student Activities L-wave:**
  1. select one student to speak into computer/mic to record "sounds" (have written phrase available).
  2. play back recorded message noting "wave" display. Repeat with a second volunteer.
- ☐ **Mini-Lesson - Longitudinal Wave:** above (2nd) activity = L-wave; waves' vibrations occur in the direction of wave motion - sound waves are L-waves - think: the push the air in front of them (a bunch of people in a slow moving line) **(Longitudinal wave diagram);** it needs a medium (like air) to operate
- ☐ Small groups: discuss possible other types of energy that use L-waves and T-waves, feel free to come up and get a better look at the computer display of the acoustic (sound wave)

Space Exploration Training Notebook

Name:

Grade:

Age:

Activities Completed

- ☐ Notebook
- ☐ Cardiovascular Training
- ☐ Nutrition & Sleep
- ☐ "Landmarks"
- ☐ How Are Craters Formed?
- ☐ "Survival"
- ☐ "Working Together"
- ☐ Soviet Space
- ☐ Americans in Space
- ☐ Lunar Lander/ Simcity Moon Colony
- ☐ Space Shuttle
- ☐ "Why Space?"
- ☐ Space Literature
- ☐ Space Adventure

NAME JOE BUSTILLOS

DATE 12/1/93

LEARNING CENTER

THEME: SPACE EXPLORATION

STRAND/SCIENCE TOPIC: ASTRONAUT TRAINING: PROBLEM SOLVING & OBSERVATION

ACTIVITIES:

1. TRAINING JOURNAL
2. CARDIOVASCULAR TRAINING / PHYSICAL FITNESS
3. NUTRITION
4. LANDMARKS -
5. WORKING TOGETHER / SOLVE SPACE CONCENTRATION
6. COMPUTER SIMULATIONS
7. WHY SPACE / JOURNAL OBSERVATION
8. LITERATURE / SPACE ADVENTURE RESOURCE

Neat!

Would be fun - especially for those w/some critical thinking skills

Criteria:

I.	Inviting/motivating/creative	5pts.	5
II.	Self-explanatory/clear directions	5pts.	5
III.	Topic focused/minimum 8 activities	5pts.	5
IV.	Variety of learning modalities	5pts.	5
V.	Appropriate evaluation for activities	5pts.	5
	TOTAL SCORE	25pts.	25

Super job, Joe!

ED607 11/17

Learning Centers
(work in progress)

Theme/Focus

5 pts – appealing
5 pts – 8 separate activities
5

- WHAT HAPPENS?
- HOW DO YOU KNOW HOW IT'S DONE
- PATTERNS IN NATURE
- LEARNING MODALITIES

JOURNAL?

8 ACTIVITIES

ONE OR TWO

HOW DO

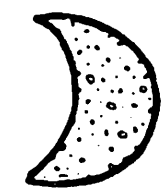
FAITHFUL ELEPHANTS } WAR & COST W/ ANIMALS
YUKIO TSUCHIYA }

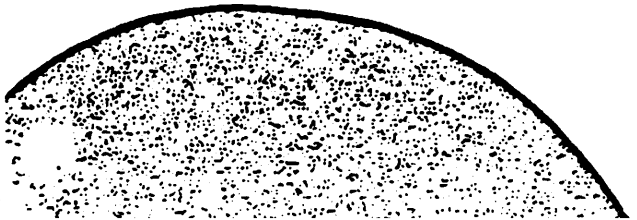
Moon Walk and Talk

(student page)

You are a member of the moon space crew originally scheduled to rendezvous with a mother ship on the lighted surface of the moon. Due to mechanical difficulties, however, your ship was forced to land at a spot some 200 miles (320 km) from the rendezvous point. During reentry and landing, much of the equipment aboard was damaged, and because survival depends on reaching the mother ship, the most critical items available must be chosen for the 200-mile (320 km) trip. On this sheet of paper are listed the 15 items left intact and undamaged after landing. Your task is to rank order them in terms of their importance for your crew in allowing them to reach the rendezvous point. Place the number 1 by the most important and so on through 15, the least important.

				Number Difference from NASA	
Undamaged Items	**My Ranking**	**Group Ranking**	**NASA Ranking**	**My Difference**	**Group Difference**
Box of matches					
Food concentrates					
50 feet of nylon rope					
Parachute silk					
Portable heating unit					
Two 45-calibre pistols					
One case of dehydrated milk					
Two 100 lb. tanks of oxygen					
ellar map (of moon's constellations)					
Life raft					
Magnetic compass					
5 gallons of water					
Signal flares					
First aid kit containing injection needles					
Solar-powered FM receiver-transmitter					
				MY TOTAL Difference from NASA	**GROUP TOTAL Difference from NASA**





11/17

Moon Walk and Talk ★

(student page)

You are a member of the moon space crew originally scheduled to rendezvous with a mother ship on the lighted surface of the moon. Due to mechanical difficulties, however, your ship was forced to land at a spot some 200 miles (320 km) from the rendezvous point. During reentry and landing, much of the equipment aboard was damaged, and because survival depends on reaching the mother ship, the most critical items available must be chosen for the 200-mile (320 km) trip. On this sheet of paper are listed the 15 items left intact and undamaged after landing. Your task is to rank order them in terms of their importance for your crew in allowing them to reach the rendezvous point. Place the number 1 by the most important and so on through 15, the least important.

Undamaged Items	My Ranking	Group Ranking	NASA Ranking	Number Difference from NASA: My Difference	Number Difference from NASA: Group Difference
Box of matches	12		15		
Food concentrates	4	4	4		
50 feet of nylon rope	7	8	6		
Parachute silk	8	9	8		
Portable heating unit	3	3	13		
Two 45-calibre pistols	15		11		
One case of dehydrated milk	5	5	12		
Two 100 lb. tanks of oxygen	1	1	1		
Stellar map (of moon's constellations)	9		3		
Life raft	13		9		
Magnetic compass	10		14		
5 gallons of water	2	2	2		
Signal flares	11		10		
First aid kit containing injection needles	14	6	7		
Solar-powered FM receiver-transmitter	6	7	5		
				MY TOTAL Difference from NASA	GROUP TOTAL Difference from NASA

WASHINGTON D.C.

28546

Space Pioneers

A new planet has been discovered in our solar system. This planet resembles Earth in every way, except that there are no human beings living there. Our government wants the students of this class to be the first pioneers to settle on the newly discovered planet. They want you to select five adult advisors that you think would be valuable on the new planet. Select from the following list of ten people:

1. Zelda Learner, age 45. Elementary school teacher.
2. Oroville Oates, age 41. Farmer.
3. Clara Kettle, age 34. Cook.
4. Dr. Margarita Flowers, age 27. Botanist.
5. Woody Hammer, age 56. Carpenter.
6. Flo Nightingale, age 37. Registered nurse.
7. Betty Bechtel, age 32. Engineer.
8. Melvin Melody, age 24. Musician.
9. Reverend Adam Goodfellow, age 51. Minister.
10. Roger Kraig, 30. Professional baseball player.

Joe Bustillos
17300 East 17th Street
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714-832-7778

Joe Bustillos' Class Reflections

ED507 Math/Science section 02

September 1, 1993

Honest, open, frank---those are dangerous words indeed when one is looking for a written evaluation. Okay . . . it was a little different facing this apparent tag-team approach to teaching. Whether or not the two of you actually scripted out your individual parts it came off very well. I know every time I've worked with another person or persons in a presentation format there was usually a lot more "dead air" than either of us would have wanted. So, you guys get a solid "9" for performance and "smooth" transitions. I mean, the rhythm was pretty good, but I'm not so sure how easy it will be to dance to this tune.

I was *really* disappointed that you weren't going to review all the physics and trigonometry that I never learned (I guess I'll have to order a copy of "Hooked On Mathematics"). I'm sorry if this seems less than truly reflective (I get this way after three-hours sleep in two days), but this is the third class that would like honest, open, frank class reflections--and I always seem to run low on franks by this time of the week . . . (sorry, that was weak). But I am looking forward to approaching the pedagogy of Mathematics from a fresh non-flash card perspective. JBB

one of my favorites (")

yes

September 8, 1993

Me thinks that may have screwed up with my chapter response work. After working with the other students at my table it is quite evident that I skimmed when I should have "shimmied." Ugh. The best part was after being so proud about "successfully" (the key word here being "successfully") reading the math framework I found out that it was the wrong one book (I read the blasted Orange book and not the Brown one). Ugh, again. The only thing that I can say about the Science Framework is that I agree with Dennis McGeeney, a great cover photo of the Space Shuttle but very little between the pages.

The concept of "estimating" when discussing "math" will take some getting used to. Having to use Herseys "Hugs" for the exercise certainly made it "bearable" (the other kind of hugs would have been equally acceptable--- well, actually of approximately equal acceptance). Ha

The use of the books (whole language) and the various group activities reminded me more of "camp" or "retreat" exercises than part of mathematic curriculum. I think that I can handle this just as long as the "activities" don't become a action-oriented filler like the more typical workbook exercise can be. What's the purpose, I know I'll have to continually ask myself, and did this exercise meet that purpose. JBB

September 15, 1993

Oh, I love taking quizzes, especially short essay quezzes. Unfortunately my penmanship doesn't seem to hold up too well when I write long-hand--- that being one of the chief reasons that I take my notes using this computer (it ain't just for my health). It may seem like high-tech to my fellow students but it's darn near become survival to me. Funny thing was when we were doing our little "what technology could not do without" my first thought was not the computer but the damn microwave oven---first order of business: Survival (once I've eaten, then I can write). Thus the question becomes, what will I do when I have to write on a board or write those lovely little notes on my students' papers? Well, I guess I could distribute a "Student's Key." Or, more realistically, I can prevail upon copying my notes and outlines to

transparencies and using an overhead projector. That's not a bad idea---just as long as it doesn't degenerate into one of those long meaningless "lectures" where the projected material doesn't add anything to the discussion. Thank God for Clipart!

The funny thing is I can write legibly (especially considering 6-years of Engineering-Drafting and Architecture in Jr. High and High School) but it's so much slower than typing on the computer. I get nothing from forming letters on the page by hand (except a sore hand after about 15-minutes). I guess I'm pretty damn lucky that the technology has shown up at this time. And given my wonderful penmanship it's not likely that I will put some hard cash down on one of these new Pen-based computers. I mean, I like using a pen-like device to draw but for writing it seems like a huge step in the wrong direction. Maybe one of my future long-suffering students will invent a way to convert my chicken-scratches real-time into legible type (what a concept).

Hopefully

September 17, 1993
OBSERVATION HOURS: Venado Middle School, Irvine
INSTRUCTOR: Debbie Lipinski, Joan Donnoho
HOURS: 3.5

Is this your observation? It sounds

This morning I checked with Ms. Lipinski in the MAC lab. An instructor in the Enrichment classroom needed help with a MAC SE. I then spent the rest of the time preparing the Apple II lab for Ms. Donnoho's Typing class.
JBB

as though you assisted in the lab?

September 22, 1993

I was right about the penmanship thing. "Kind of hard to read, Joe---but I think you have the essence of the framework." And I even wrote in capital letters, hoping to make the thing more legible. Ugh. At least it didn't work against me (it's been my experience that less than perfect penmanship is just the excuse some instructors need to become a red-pen waving raving maniacs). Thank you.

I also finally figured out what you two wanted with the Chapter response sheets. Gee, what was so difficult about finding "three most

important points"? I guess I didn't read the instructions very well. I'm confident the the two sheets I turned in will be better understood than my first attempt. Thank God that comprehension has become the hallmark and not "Number of Questions answered Wrong."

One final note: for some highly subjective reason (which is also quite unclear to me at the moment) the little group building exercise of writing a nice note for each of our neighbors really did feel good. For whatever reason I have yet to sit at the same table with the same group any two weeks in a row (well, for one thing I didn't know that we were supposed to sit in the same group). Anyway, it was a nice touch at the end of a very long day to get nice notes from almost complete strangers (some stranger than others). JBB

Glad you liked it.

September 29, 1993

Well, things started out rather dark and continued that way for much of the night . . . Lesson one in the educational process: one must always remain flexible because, in the classroom, the exception is the rule (the second lesson is to be well planned so that you have a clear idea of what to eliminate when your plans fall through). Fortunately I was not one of those who did not have to drive too far only to discover that Chapman was without power (hell, I could have figured that one out . . .). That did give me a little extra time to work on my journal article. Yippee! JBB

October 6, 1993

Getting up in front of a group of people is not a new experience for me. But somehow every first time feels like a "first time." Ugh. I really wanted to do a better job demonstrating the game---I even went through the hassle of loading the SimCity on my laptop. But several mid-course corrections knocked me far enough off track that I thought better than to make a room full of people squint at a monochrome computer screen (I wish that I had taken the time to adjust the overhead so that the whole page of each transparency could have been seen). Alas, chalk that one up as an okay first attempt. Next time, next time, just you wait. JBB

October 13, 1993

Tonight's class reminded me of an old Pacific Telephone joke: "Yesterday I couldn't spell 'Enginear' but now I are one." After all of the blood, sweat and tears this is the first time that I can actually see this educational thing as being "doable." Yippee.

Also, giving our Math lessons in our set group setting made it somewhat more endurable. I know that when we talk about creating an atmosphere of trust we are usually talking about making giving our students that sense of community but in this case it was very important for us greenhorn teachers. Yep, I guess now I really are one. JBB Hooray for you!

October 14, 1993
OBSERVATION HOURS: Venado Middle School, Irvine
INSTRUCTOR: Debbie Lipinski, Joan Donnoho
HOURS: 3.0

Again - is this observing a teacher or working in a lab?

This morning I checked with Ms. Lipinski in the MAC lab and helped some of the students work on their Hyperstack projects. I then went to the Apple II lab to assess what help Ms. Donnoho might need with her aging Apples.

October 15, 1993
OBSERVATION HOURS: Venado Middle School, Irvine
INSTRUCTOR: Debbie Lipinski
HOURS: 2.5

Ms. Lipinski needed someone to "cover" the MAC lab while she was away from the campus (a credentialed instructor was available in the library next door). I continued to help the students with Hyperstack projects. Another person working toward her teaching credential through UCI showed up a little later. She was spending time at Venado for her Microcomputer "clear credential" requirement. JBB

I hope you weren't the one to "cover" — You were supposed to be observing!

October 18, 1993
OBSERVATION HOURS: Venado Middle School, Irvine
INSTRUCTOR: Joan Donnoho
HOURS: 1.5

I don't think, so! Where were the children?

Ms. Donnoho's aging Apple II's needed attention. Actually, it wasn't the Apples but the failing printers attached to them. As technology marches on it's amazing how these "perfectly good" resources are left behind. The Apple II lab has been virtually abandoned for the newer MAC lab by all of the teachers except Ms. Donnoho and her keyboarding class (formerly called "Typing"). While I worked on one of the printers a lone teacher was working on his gradebook using one of the Apples. I commented to him about his dedication to be using these "ancient" machines. He said that he used to teach programming (Logo) on these machines before the era of the MACs. It was kind of sad. JBB

October 20, 1993

Perhaps in a twisted sort of way, I really did like the broad selection of questions that were asked on our take-home midterm. Funny how I put the thing off for most of the weekend and then discovered how much I liked it once I started working on it. Surprise, surprise. ☺

Critical thinking---asking "why" questions, "how did you come up with that solution?", "if that is true than what should follow." Simply put, getting passed the data to the thinking behind the data. What a concept.

For whatever reason so much of what we "encounter" in Math and Science is presented outside its contextual background---like a palm tree in a barren desert. And whatever led up to this discovery, for example, or whatever resulted from it is left off from the discussion ("just remember the salient facts")---little wonder young minds care not one wit about the subject matter. Contextualization is an important part of critical thinking. Getting passed the symbols on the page to the mind that put them there and why. It's extra work for us soon-to-be lowly teachers, but the "ah-ha" always make sit with that extra step. JBB

October 22, 1993
OBSERVATION HOURS: Venado Middle School, Irvine
INSTRUCTOR: Debbie Lipinski
HOURS: 4.0

You were to be the observer, Joe!

Ms. Lipinski needed help in the MAC lab. A substitute with very little Macintosh experience had been dropped into our little high-tech environment. He was a retired aerospace contractor who had been doing Assembly language programming on IBM type computers back in the days when Wozniak and Jobs were paperboys, but he was new to the classroom and Graphic-User-Interfaces (GUIs). It was an interesting morning. JBB

October 27, 1993 What does this have to do, w/ class? I'm really confused!

Ugh. I can't believe that it's time for the science lesson already. One thing I'm learning from this experience is the need to keep things clear and simple. This doesn't mean that the content should be sacrificed, just that "difficult" are only that way when they are approached without sufficient background information or in a vague sort of way. Now if only my "sound port" will come in for the laptop before next week's lesson. JBB

November 3, 1993

I called the company that promised me three weeks ago that they'd be shipping me my "sound port" in two weeks. The woman on the other end of the phone said that my order was still on "back-order." Ugh. Without the "sound port" my science lesson would be reduced to . . . I could always bring in my desktop computer to do the demo but that would be a royal pain (if you are using technology rule number one is: always have a well-thought out plan "B"). So rather than lug in my desktop I purchased a different sound device (at twice the cost of the one that I had ordered). Alas, the device that I ended up with would have been the one of choice had it not been for the price (plan "B"s are rarely inexpensive).

What about the other lessons that you saw?

Anyway, everything turned out okay. I ended up truncating my lesson again. It ended up being more "lecture" and less "hands-on" than I had hoped. Part of the problem was my inexperience, I think. I could have easily moved on to a second "volunteer" to demonstrate sound waves but I felt compelled to cut it off where I did. One thing, we were certainly more comfortable with each other than we were for our last lesson exercise. I ended up manning the video camera for everyone else's lesson and enjoyed the experience thoroughly. JBB

November 10, 1993

Classroom discipline---I had read a book in Soohoo's ED508 class that was entirely about classroom management strategies (actually we jigsawed the book among ourselves---less reading). But it really brought home the point about planning and behavior expectations and establishing a routine. My experience with the former aerospace contractor in Venado's MAC lab reminded me that having a certain level of technical expertise does not guarantee even passing proficiency as a teacher. Good stuff to learn (and practice). JBB

November 11, 1993
OBSERVATION HOURS: Lampson Elementary School, Garden Grove
INSTRUCTOR: Christie Yoshida
HOURS: 2.5

This is a real observation! At last!

This morning Ms. Yoshida did her "owl droppings" activity with her 5th grade class. The students had been studying their skeletal systems before this exercise. Ms. Yoshida explained what "owl droppings" were and what they would most likely find in their droppings. The class was paired off with each pair being given a dropping to work on. After an expected level of commotion and disgust. the students began to pull the mice bones from their owl droppings. JBB

November 15, 1993
OBSERVATION HOURS: Lake Center Middle School, Little Lake School District
INSTRUCTOR: Paul Quinby
HOURS: 3.0

Mr. Quinby worked with his class on the data charts from an experiment they'd performed last week on volocity, acceleration and mass. The experiment was to measure the time it took a bicyclist to go 50 meters, measuring his time every 5 meter increment, using three different riders. Then they added 50-kg to each bicycle and repeated the experiment. The class needed to establish averages for each increment of the three riders without the extra mass and with extra mass. Once they figured out the averages they plotted one volocity curve (without extra mass) on and X/Y graph (X=volocity, Y=distance). They then plotted the second curve on the same graph. JBB

I hope this didn't last 3 hrs!

These reflections on class meetings are rather strange, but I'm going to give you the 5 points for effort. I'm more concerned about the 20 hours of "observation"?

EDUC 507 Teaching Strat:
Math/Science Observation Log

DATE	HOURS	SCHOOL	SIGNATURE
9/17	3.5	Venado Middle Sch	D. Kupinski
10/14	3.0	Venado Middle Sch	D. Kupinski
10/15	2.5	" " "	D. Kupinski
10/18	1.5	" " "	D. Kupinski
10/22	4.0	" " "	D. Kupinski
11/11	2.5	LAMPSON ELEMENTARY	Christie Joshua
11/15	3.0	LAKE CENTER MIDDLE SCH	[illegible]

-1

TOPIC SECTION:

TOPIC: Classroom Climate

SUMMARY OF OBSERVATIONS: In most of the classrooms I've observed that things are either self-regulated (the lab situations) or teacher directed. In the Middle Schools the students worked more as individuals, whereas in the fifth grade environment the students were paired up and tended to work in "natural" groups of four. In one of the middle school classrooms there was a definite "adversarial" atmosphere where the interaction was generally controlled by the teacher's negative comments. The lab situations were definitely the most relaxed. -1/3 pt

How did the rooms look? feel? interaction among students?

RELATIONSHIP TO THEORY & INFORMATION: The fifth grade class was the best example of having a well-defined set lesson plan and how "easily" it was accomplished. The science lesson was proactive, the teacher had pre-selected how the students would be paired, the materials were set, they had already done preliminary work on skeletal systems, and it was completely hands-on. In all fairness to one of the middle school lessons, they were concentrating on the "write-up" section of an experiment that had taken place the week before. -2/3 pt

What did your text say about classroom climate? It certainly is more than a lesson plan?

PERSONAL REACTION & REFLECTION: I was immediately aware of the vast difference between the one middle school classroom and the elementary classrooms that I had observed. As noted above, there was a very strong adversarial feeling to the room. One of the things that I noticed was the middle school teacher seemed a lot more stingy with his praise. None of the classrooms were "wild" or out of control in the least but the atmosphere in the fifth grade classroom was the most comfortable

UNANSWERED QUESTIONS: My question about the classroom that I felt most negative about was whether that was simply because of the "developmental cycle" those students are in (versus the developmental cycle of the younger students) or whether my impression was due to an insufficient sample (one day, versus several in the other classrooms) Often times, one visit can tell much about classroom climate.

-1 1/3

TOPIC: Planning & Curriculum

SUMMARY OF OBSERVATIONS: In the first teacher I interviewed her attitude toward planning was very casual and open-ended. In the lab environment the instruction is almost 100 percent hands-on and paced by the individual student's progress. "Planning" for hardware failures (see computers/technology below) was her greatest concern. The material and actual course-work/curriculum is pretty much set by the course heading ("intro to computers" etc.). Does she determine the content or the district.

The second teacher I talked to was a lot more impacted by the "variable" nature of school assemblies/short days/rainy days/etc. Having a flexible attitude about planning and not getting overly hung up on teaching with one eye on the clock seems to be key to her. This is not to say that she's not concerned about being "on task" but it's just another thing for her to juggle. Does she plan weekly, monthly or how? Where does the curriculum come from?

The third teacher I talked to was more concerned about planning because he felt like he need to get more accomplished in a shorter period (having his students only for one-hour periods). I have known this teacher for some time and know that he has always been concerned about having a "good lesson plan" like it's the holy grail of teaching. Needless to say, it continues to allude him. So - how does he plan?

All of the teachers worked within their given curriculum guidelines.

-1/3 pt

RELATIONSHIP TO THEORY & INFORMATION: Planning, planning, planning; each teacher had their planning methodology adjusted to their class structure and their average school routine. The one teacher very concerned with having a complete lesson plan actually wrote very little down, but as far as his class process was concerned he had a "working plan."

-2/3

More summary

The book clearly pointed out that new teachers tend to fixate on having a point-by-point lesson plan. The other side of the coin are the teachers that are unprepared and wonder why their students are so unresponsive and/or why they can never get anything done. The fifth grade classroom was the best example of getting things done and remaining flexible. This wouldn't be possible if she wanted written down a plan that worked for her.

Is this all that you learned from text for discussion?

PERSONAL REACTION & REFLECTION: Of the three examples I really didn't find that any of the teachers didn't have a healthy attitude about lesson planning and curriculum. All of them, regardless if they admitted it to themselves or not, had gravitated toward a lesson plan method that worked for them.

-1/3

I wish you had shared that with me.

UNANSWERED QUESTIONS: This isn't so much as much as a concern for assessing when material is "5th grade level" or not. It's been demonstrated in other classes the difficulty we new teachers have in pacing our information for our given grade level. I suppose this is another case of "trial by fire."

I don't understand your question. Sorry.

-1

TOPIC: Classroom Questioning

SUMMARY OF OBSERVATIONS: With the exception of the middle school lab environment all of the other classrooms were Q&A driven. Some of the teachers pontificated more than others. But they were all dependent on student reactions to gauge their own progress and whether their students were getting the material.

-1/3

Describe it, please.

RELATIONSHIP TO THEORY & INFORMATION: Clearly the books position is that learning does not take place when students are not involved. Extended lecturing or disconnected passive demonstrations may be good for the teachers ego (as some sort of "authority") but research show that very little learning takes place. Consistent, relevant Q&A is a good method of encouraging student involvement.

-1/3

A slight touch of what you learned.

PERSONAL REACTION & REFLECTION: It amazes me how many people still think about the business of teaching and have images of someone standing behind a podium and lecturing for hours unending. It was not very long in my educational career before I realized that that mode of teaching was "effective" within very limited situations by very gifted individuals. People learning when they

-1/3

are involved in their own learning. Q&A is the simplest way of knowing if the "message" is getting out. Did you see that ?

UNANSWERED QUESTIONS: none.

-1/3

TOPIC: Use of Manipulatives in Math

SUMMARY OF OBSERVATIONS: None of the classrooms that I observed used math manipulatives. Granted I was observing "upper" grades and most of the lesson were more "science oriented" than math oriented, but very little was done in the way of presenting math in a non-theoretical mode. -2/3 How was the math presented?

RELATIONSHIP TO THEORY & INFORMATION: Burns and our class said that there was no reason to stop the use of math manipulatives just because some students have shown proficiency in basic math skills. -2/3 I hope that you learned more than this.

PERSONAL REACTION & REFLECTION: I would not "judge" the teachers for not using math manipulatives because their use of math was more within the context of their science lesson (measuring, averaging, adding, etc) and not necessarily teaching "new" math skills. If there had been a problem accomplishing some of these operations (and therefore holding back the science lesson) than math review and the use of math manipulatives would have been a perfect lesson change. Such was not the case.

UNANSWERED QUESTIONS: Actually, it would be interesting to see how these teachers might have used math manipulatives as a part of these science lessons (of course, without it appearing to be tacked on).

Is this a question or a rhetorical statement?

-2/3-

TOPIC: Traditional Group Learning & Cooperative Learning

SUMMARY OF OBSERVATIONS: As with the some of the above methods, very little cooperative learning was used in the classrooms I observed. The fifth grade classroom worked in groups of two and clusters of four. The middle school kids in the lab freely helped each other. The middle school kids in the other classroom were actually supposed to "do their own work" but tended to pass their papers around.

RELATIONSHIP TO THEORY & INFORMATION: The current school atmosphere away from individual seat work and more group interaction was reflected in most of the classrooms I observed---even when this did not appear to be by design. Even in a heavy-content environment, group interaction can fortify the learning rather than water it down.

2/3

Same problem? -- no meat!

PERSONAL REACTION & REFLECTION: Working in groups might have helped the one middle school classroom---they showed a tendency to work in groups anyway. This might have added or created a greater sense of community and less conflict. Given that this teacher had to work without an Aide, I'm not sure

why he chose to keep them seated in "Rows and Columns." By keeping students in an individual seat-work mode I think that some benefits were lost in not allowing the more "advanced" students help those who were struggling with the material / Good point.

UNANSWERED QUESTIONS: As I stated above, I'm not sure why the one teacher kept them in Rows and Columns.

Perhaps he doesn't trust cooperative learning because he's not in total control?

-2

TOPIC: Critical Thinking Skills

SUMMARY OF OBSERVATIONS: All of the classrooms I observed asked the students "Why" or "How" had reached a given solution/conclusion. Sometimes the question was not asked enough but there was a definite emphasis in knowing "Why" something was a certain way and not just rote knowledge. -2/3

What were some of the examples that you saw?

RELATIONSHIP TO THEORY & INFORMATION: Another method of assessing, enforcing, encouraging learning----getting to the thinking behind the answers is a very important step. The unfortunate reality is that much thinking about education by those outside of education emphasizes the "Trivial Pursuit" mentality about learning: he who knows the most irrelevant facts wins. I don't think so. -2/3

Makes no sense!

PERSONAL REACTION & REFLECTION: It was very encouraging that all the teachers so consistently got behind the answers to the student's thinking. I felt like they were pushing their students toward good learning skills. -2/3

How?

UNANSWERED QUESTIONS: Sorry, none this time.

-1 1/3

TOPIC: Evaluation of Student Learning

SUMMARY OF OBSERVATIONS: Each classroom that I observed had a style of its own. The middle school lab based its student evaluation of the products the students produced---if they understood the material it was pretty clear from their work. The fifth grade classroom used a variety of assessment methods: written, oral, group, individual, open-ended problem solving, critical thinking. With the other middle school classroom I didn't observe much in the way of assessing student learning except classroom participation.

RELATIONSHIP TO THEORY & INFORMATION: The one fifth grade classroom really reflected the thinking about working with multiple intelligences when it came to presenting and reflecting on the given material. The other classes less so.

-2/3

?

PERSONAL REACTION & REFLECTION: Again, finding little student evaluation may have stemmed from my lack of exposure more than a lack of usage.

-2/3

UNANSWERED QUESTIONS: None.

-1 1/3

TOPIC: Use of Computers in the School

SUMMARY OF OBSERVATIONS: In the one classroom, obviously, all of the teaching was conducted on computers. The others didn't have a computer present in their rooms.

RELATIONSHIP TO THEORY & INFORMATION: Having done some research in this area it would seem that the current school policy about computers is to provide them for student usage in labs, like the one middle school, and not in individual classroom or student basis.

-2/3

What does text, frameworks and/or discussion say about computers?

PERSONAL REACTION & REFLECTION: Given the state of most school budgets an overemphasis on technology may actually go a long way toward "ruining" it for future generations. Just like any other methodology or tools, computers can be very effective but only within specific, well-thought-out situations. And rule number one about using computers and other technology is to always have a meaningful plan "B".

-2/3

What has this to do w/ what you actually saw?

UNANSWERED QUESTIONS: None, again.

TOPIC: Motivation and Discipline

SUMMARY OF OBSERVATIONS: In the middle school classroom discipline was a major focus---getting students to sit in their seats, to do their work, to pay attention. In the other two schools this was not nearly a problem.

What did you see?

RELATIONSHIP TO THEORY & INFORMATION: Whereas discipline may have been a major focus in the one classroom, it was not necessarily a problem. The teacher had a plan that the students understood and acted consistently when they "crossed the line." In the fifth grade classroom, discipline and motivation were kept moving because the teacher kept the class moving.

PERSONAL REACTION & REFLECTION: The one thing that I might have changed in the middle school classroom was more positive praise.

Why?

UNANSWERED QUESTIONS: none

TOPIC: Hands-On Science Lessons

SUMMARY OF OBSERVATIONS: Again of the classrooms I observed the fifth grade classroom really shined in the area of getting all of the students involved in the learning. Because the one middle school was essentially a lab, they also were 100 percent dependent on the students learning by doing. The other middle school had done their science lesson, at least the doing part when I wasn't there so I didn't get a chance to see it (but obviously, they learned by doing).

RELATIONSHIP TO THEORY & INFORMATION: Again, the strength in learning by "doing" rather than reading or watching a video. All three classrooms demonstrated this model.

PERSONAL REACTION & REFLECTION: Learning by doing certainly seemed a lot more "exciting" to me---but whether it is more effective than by watching a video . . . well, logic would dictate that doing is much more effective than watching. I'd be interested to see how much information is retained or whether any transference of information takes place after a given interval of time has passed.

UNANSWERED QUESTIONS: Doing is great, but how much is retained and how much content is sacrificed in an effort to present things in a "doing" environment.

We know (your text verified) that children & adults learn much more by doing!

A teacher affects eternity; he can never tell where his influence stops.

— Henry Brooks Adams

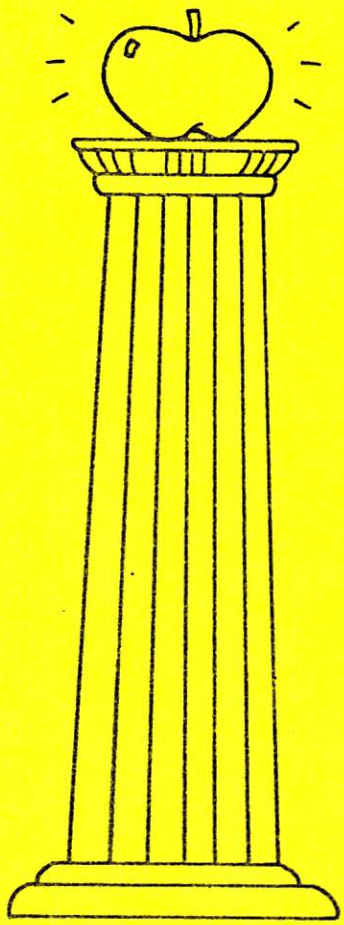
To Joe Bustillos

Best wishes for the future.

Dennis McGeeney Sally Melton 12/8/93

Signed Date

GOLDEN APPLE AWARD



to

Joe Bustillos

for

An Out of This World Learning Center

Dennis McGeeney Sally Melton

Signed

12/8/93

Date